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National Nuclear Research Capabilities Expand at National Scientific User Facility

IDAHO FALLS -- The Advanced Test Reactor National Scientific User Facility (ATR NSUF) has added several new nuclear research capabilities with the support of two new partners. The addition of Pacific Northwest National Laboratory (PNNL) and Purdue University – plus one additional facility at current partner Oak Ridge National Laboratory (ORNL) – significantly increases the sample analysis and post-irradiation examination opportunities offered to researchers.

These additional partners offer a wide range of facilities, from reactors to ion beams, and from synchrotron radiation to specialized post-irradiation examination instruments. Through ATR NSUF's peer-reviewed proposal process, researchers can gain access to any of the facilities – both at INL and its 10 partners – expanding opportunities for researchers performing cutting-edge nuclear energy science and engineering.

"The addition of these facilities to the NSUF is a strong indicator of the belief that the NSUF model – pairing the best research ideas with the best facilities across the country – is the direction of 21st century nuclear R&D," said ATR NSUF Scientific Director Dr. Todd Allen.

With the partnership, PNNL is offering access to its Radiochemistry Processing Laboratory (RPL), Materials Science and Technology Laboratory (MSTL) and irradiation experiment design and fabrication capabilities. The RPL and MSTL facilities offer a wide range of specialized equipment for handling and testing fuels and materials. Capabilities include experiment hardware design, fabrication and assembly, testing facilities for both nonradioactive and radioactive structural materials, and the advanced characterization of unirradiated and irradiated fuels and materials using instruments including transmission electron microscopy (TEM), scanning electron microscopy (SEM) and optical microscopy.

Purdue University is providing access to its IMPACT (Interaction of Materials with Particles and Components Testing) facility, which offers a wide range of spectroscopy techniques to study the surface of materials. The IMPACT facility houses a variety of examination instruments including low-energy scattering spectroscopy (LEISS), X-ray photoelectron spectroscopy (XPS), auger electron spectroscopy (AES), extreme ultraviolet reflectometry (EUVR), extreme ultraviolet (EUV) photoelectron spectroscopy and mass spectrometry.

In addition to ORNL's High Flux Isotope Reactor (HFIR) and associated post-irradiation examination facilities, which were offered as partner facilities in 2011, researchers now have access to ORNL's Low Activation Materials Development and Analysis (LAMDA) Laboratory. The LAMDA facility is a set of multipurpose laboratories that offers a variety of instruments for post-irradiation examination of low-dose radiological materials. LAMDA has various post-irradiation examination capabilities, including refractory element test stands for tensile testing, optical and scanning electron microscopes, and thermal diffusivity and density measurement equipment.

Since its designation as a National Scientific User Facility in 2007, ATR NSUF has awarded 40 total experiments involving 23 universities and their collaborators. To learn more about proposing research, please visit the ATR NSUF website at http://atrnsuf.inl.gov.

INL is one of the DOE's 10 multiprogram national laboratories. The laboratory performs work in each of DOE's strategic goal areas: energy, national security, science and environment. INL is the nation's leading center for nuclear energy research and development. Day-to-day management and operation of the laboratory is the responsibility of Battelle Energy Alliance.

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